Laws and Tools to Reduce Idling

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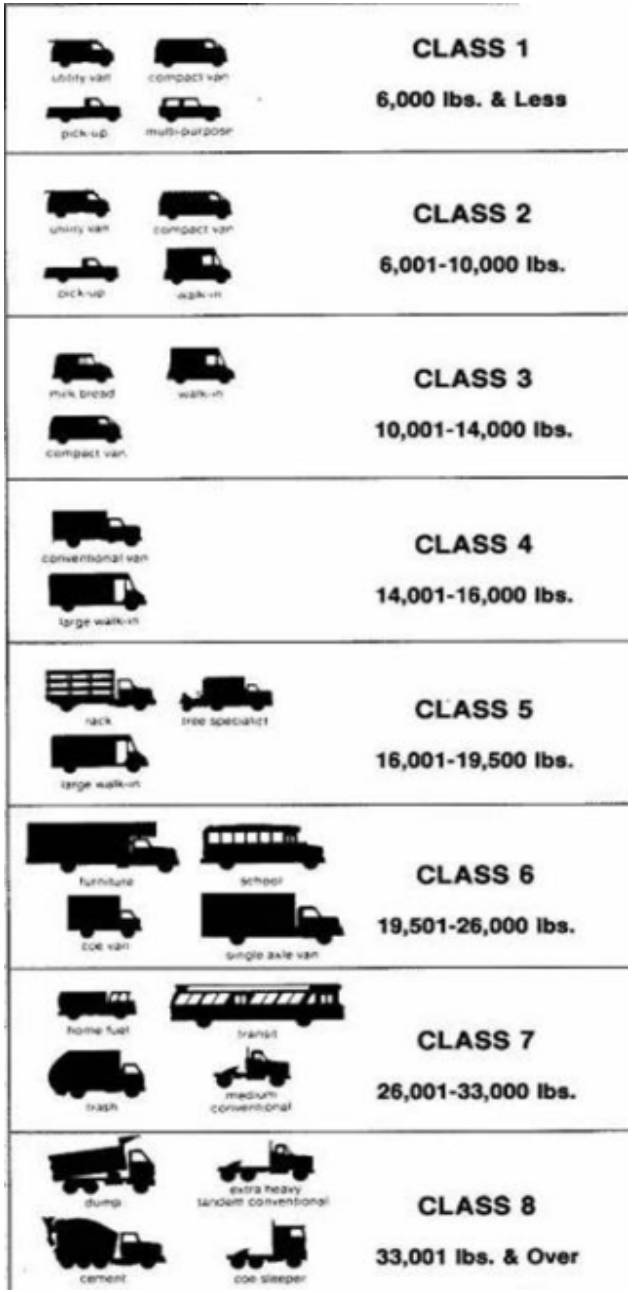
Why is Argonne interested in idling reduction?

- DOE cares about idling reduction (IR) because one of its primary missions is reducing petroleum usage
  - Idling wastes about 6 billion gal/y of fuel
  - About 1/2 of that is from trucks idling overnight and during the workday
- At ~$4.00-$4.14/gal, all types of vehicle owners should care
- IR is low-hanging fruit
  - It can be free or have short payback

Anti-Idling Laws

Drivers of all classes of vehicles idle

- Parents in passenger cars dropping off and picking up children at school
- Work trucks at job sites
- Trucks making deliveries
- Transit, school, and commuter buses
- Long-haul truckers during federally mandated rest periods
- *And even locomotives, tug boats and cruise ships, and airplanes*



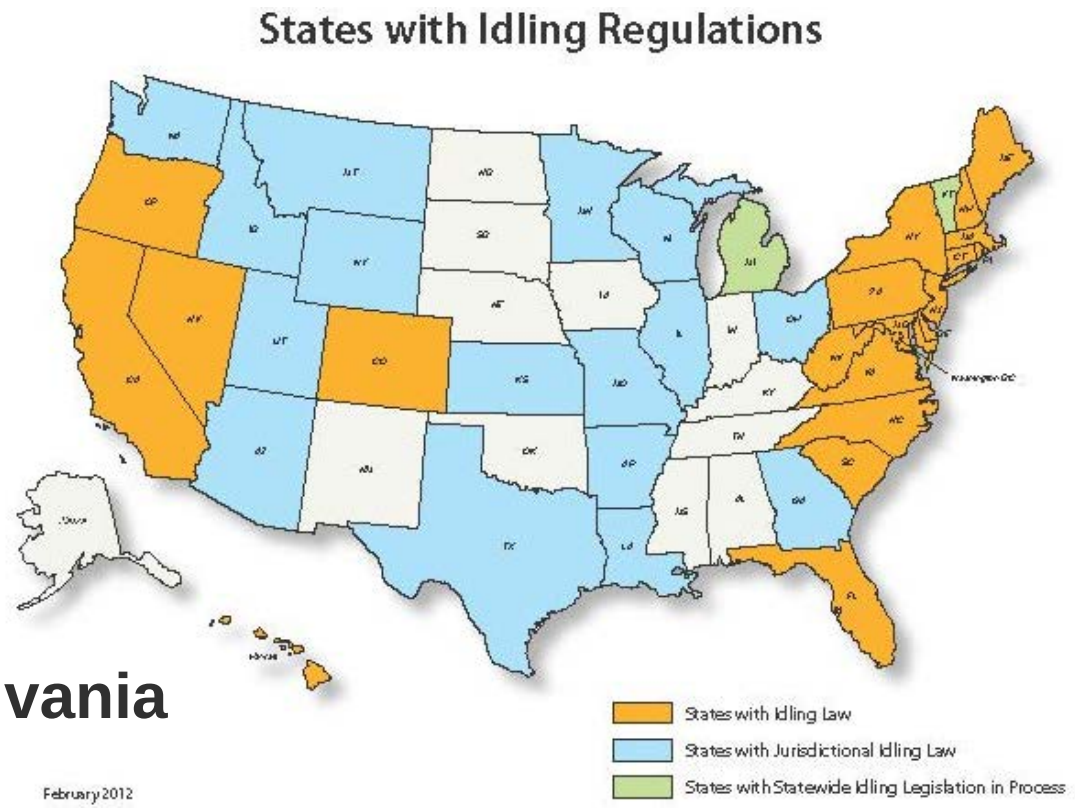
Many places have laws prohibiting idling

Idling laws vary in their application:

- **Diesel fuel**
- **Gasoline fuel**
- **Classes 1-8**
- **Time limits**

But they're rarely enforced!

EPA has a model law that only Pennsylvania has enacted



ATRI keeps an up-to-date list
Argonne also has a database

Anti-idling laws apply to different vehicle types, depending on the location

Weight Class	State/Jurisdiction
All classes	Colorado (Aspen, City and County of Denver), Connecticut, District of Columbia, Hawaii, **Illinois (Chicago, Carol Stream, Evanston, Lombard, Northbrook, Wheaton, Wilmette, Winfield, and Wood Dale),** Maryland, Massachusetts, **Minnesota (St. Cloud),** Missouri (City of St. Louis), New York (New York City and New Rochelle), **Ohio (Cleveland, Lakewood, Maple Heights, North Olmsted, South Euclid, and Village of Highland Hills)**
>8,000 pounds	**Illinois (Cook, DuPage, Lake, Kane, McHenry, and Will Counties; Aux Sable and Goose Lake Townships in Grundy County; Oswego Township in Kendall County; Metro East St. Louis area; Madison, St. Clair, and Monroe Counties), Wisconsin (Madison)**
>8,500 pounds	Delaware, Florida, Missouri, New York
>10,000 pounds	California, Georgia (Atlanta), Maine, **Minnesota (Minneapolis),** Nevada, New Jersey, Pennsylvania, Rhode Island, South Carolina, Utah (Salt Lake County)
>14,000 pounds	Arizona, **Minnesota,** Texas, Virginia

Exemptions to anti-idling laws also vary

- Armored vehicles
- Emergency vehicles
- Inspections or maintenance
- Loading/unloading passengers
- Natural gas and electric vehicles (Atlanta; Placer County, California; New Rochelle, New York)
- Power take-off equipment
- Queuing, including accessing military installations
- Recharging of hybrid vehicles (Sacramento; Placer County; New York State; New Rochelle)
- Sleeping or resting in a sleeper berth for Federal Hours of Service
- Snow removal equipment
- Temperature
- Traffic conditions
- Within mines or quarries

Costs of Idling and How to Avoid Them

Are these familiar problems?

- Fuel and maintenance costs keep rising
- You can't keep up with the trade magazines and blogs
- There's no time or money to go to meetings (except this one)
- Your drivers may be indifferent to fuel costs
- Driver training programs aren't working
- Union contracts may limit the use of technology

February 2011

February 2012

April 2012

March 2012

Workday idling is important

- Long-duration idling occurs at
  - Ports and terminals
  - Busy delivery sites
  - Border crossings
  - Restaurants
  - Tourist destinations (tour buses)
- All truck types may idle during the day
  - Idling reduction devices do not enable slow movement in queue (“creep mode”)
  - Scheduling can reduce idling
  - Daytime idling represents significant use of fuel

Idling uses over 8% of commercial truck fuel

	Fuel use (million gallons/year)			
	Gasoline	Diesel	Other	Total
Overnight idling	0	666	0	666
Workday idling*	1,416	1,002	73	2,491
Total long-duration idling fuel use	1,416	1,668	73	3,157
Total fuel use for commercial trucks*	13,922	22,681	378	36,982
Idling % of total use by fuel type	10.2%	7.4%	19%	8.5%
**Does not include PTO use*				

You can estimate your payback period for idling reduction

How Much Could You Save by Idling Less?

Instructions: In each row, start at the left and fill in the blanks with information about your equipment and costs. Then multiply or divide as shown. Some answers are used again. Where you see an arrow, copy the answer into the blank at the end of the arrow, so you can use it in the next step.

Calculate Costs for Avoidable Idling

1 How much fuel is used for idling? If you don't know, look up the number in the table below. **0.8** gallons/hour × Realistically, how many hours each year might you use IR devices instead of idling?[a] **2,000** hours/year × What is the price of diesel fuel? $ **2.75** /gallon = **Avoidable Idling Fuel Costs** $ **4,400** /year +

2 0.8 gallons/hour × 2,000 hours/year × What is your average fuel economy? **6.1** miles/gallon = "Miles of idling"[2] (idling is like putting miles on your engine) **9,760** miles/year

3 How much does an oil change cost? $ **150** /oil chg. ÷ How many miles between oil changes? **30,000** miles/oil chg. = $ **.005** /mile × "Miles of idling" **9,760** miles/year = **Preventive Maintenance Costs[1]** $ **48.80** /year +

4 How much does an engine overhaul cost? $ **10,000** /overhaul ÷ How many miles between overhauls? **500,000** miles/overhaul = $ **0.02** /mile × "Miles of idling" **9,760** miles/year = **Overhaul Costs[1]** $ **195.20** /year =

5 Add right-hand column = **Total Avoidable Idling Costs** $ **4644** /year

Calculate Costs for Idling Reduction (IR)

6 How much fuel is used by the IR device? **0.2** gallons/hour × How many hours each year could you use IR devices instead of idling?* **2,000** hours/year × Price of diesel fuel (should equal price listed in line 1) $ **2.75** /gallon = Fuel cost for IR device $ **1100** /year

7 Maintenance cost for IR device $ **100** /year + $ 1,100 /year = **Operating Cost for On-board IR Device** $ **1,200** /year

8 Cost per hour to plug into EPS[b] $ **2.00** /hour × Enter hours plugged into EPS* **0** hours/year = Cost to plug in $ **0** /year + $ 1,200 /year = **Total Operating Costs for IR** $ **1,200** /year

Calculate Savings from IR

9 Capital cost of on-board IR device $ **8,000** ÷ **Savings** Line 5 – Line 8 $ **3,444** /year saved = **Payback Time** **2.3** years

[a] IR: Idling Reduction [b] EPS: Electrified Parking Space * Total number of hours from lines 6 and 8 should equal the number of hours in line 1

How much fuel is used for idling (gallons/hour)?

Locate your idling engine RPM and the percentage of time you run your air conditioning (AC) while idling. The corresponding number is approximately how much fuel you use to idle. For example, 800 RPM with no air conditioning consumes about 0.64 gallons of fuel an hour.[1,2]

RPM	AC off	AC on 50%	AC on
800	.64 gal/h	.70	.76
900	.73	.79	.85
1000	.81	.87	.94
1100	.92	.98	1.05
1200	1.03	1.09	1.15

[1] "Analysis of Costs from Idling and Parasitic Devices for Heavy Duty Trucks," Technology and Maintenance Council Recommended Practice Bulletin 1108; issued 3/95 (reprinted 2003 by TMC/ATA)

[2] Lutsey, N.P., J.P. Wallace, C.J. Brodrick, H.A. Dwyer, and D. Sperling, "Modeling Auxiliary Power Options for Heavy-Duty Trucks: Engine Idling vs. Fuel Cells," *Society of Automotive Engineers* 2004-01-1479, October 2004.

Some solutions are EPA-verified

Vehicle Types	Technology	EPA Verified?	Services Provided	Company Examples
All	Battery Monitor-ing System	No	Restarts engine if battery low	Havis
All	Fuel-Fired heater	Yes	Heat for cab and/or engine	**Espar,** Teleflex, Volvo, Webasto
All	Plug-In	Yes	Heat, A/C, AC power	AireDock, CabAire, Envirodock, **IdleAir**, Shorepower
All	Waste Heat Recovery	No	Provides heat for limited period	Temp-A-Start
Long-haul trucks	APU	Yes (some?)	Heat, AC, AC power	Carrier Transicold, Hodyon, Pony Pack, Thermo King, Willis
Police cars	Power Manage-ment System	No	Powers electrical devices	Energy Xtreme
Trucks, buses	Thermal Storage or Battery AC	Yes	A/C	**Autotherm,** Bergstrom, Dometic, Webasto

Hybridization can reduce idling as well

Type of Hybrid	Hybrid Drivetrain	Hybrid PTO	Companies	Comments
Battery Idle-Reduction		X	Vanner	Monitors battery while using PTO
Battery Plug-In	X	X	Odyne	Lithium-ion battery, eliminates creep idle
Hydraulic	X		Eaton	Eliminates creep idle

Where to Find Information

How can I afford to upgrade my vehicles?

- Aside from your friendly banker, there are Federal and state programs that offer grants and loans for equipment that reduces idling
- Check your eligibility and get help, if necessary, preparing the paperwork

- **DOE block grants and Clean Cities**
- **DOT Congestion Mitigation and Air Quality**
- **EPA SmartWay**
- **California Air Resources Board**
- **Cascade Sierra Solutions**
- **Maryland Energy Administration**
- **Minnesota Pollution Control Agency**
- **New York State Energy Research and Development Authority**
- **North Central Texas Council of Governments**
- **Ohio Environmental Protection Agency**
- **Pennsylvania Small Business Advantage Grant Program**
- **Pittsburgh Healthy School Bus Fund**
- **Tennessee Department of Environment and Conservation**

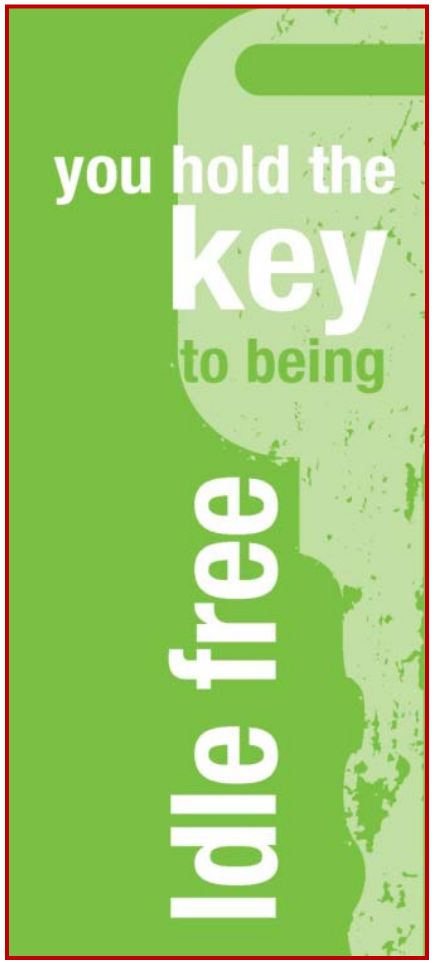
Your local Clean Cities Coalition can help your fleet find ways to reduce idling costs

And you can find even more information from …

- EPA National Clean Diesel Campaign
- Clean Cities Coalitions
- DOE Alternative Fuels and Advanced Vehicles Data Center
- Trade shows, such as the Work Truck Show and Mid-America Trucking Show
- Equipment manufacturers and dealers
- Green Truck Association
- National Truck Equipment Association

And those of us at Argonne National Laboratory

- Terry Levinson (tlevinson@anl.gov)
- Linda Gaines (lgaines@anl.gov)



Selected links for further information

Information Source	URL
Alternative Fuels and Advanced Vehicles Data Center	http://www.afdc.energy.gov
American Transportation Research Institute Compendium of Idling Regulations	http://atri-online.org/2012/01/01/idling-regulations-compendium/
Argonne National Laboratory calculators to estimate fuel savings from not idling	http://www.transportation.anl.gov/engines/idling_tools.html
Argonne National Laboratory *Idling: Cruising the Fuel Inefficiency Expressway*	http://www.afdc.energy.gov/afdc/pdfs/idling_reduction_primer.pdf
California Air Resources Board	http://www.arb.ca.gov/ba/loan/on-road/documents/hdvloanprogram.pdf
Cascade Sierra Solutions	http://cascadesierrasolutions.org/financing.aspx
Clean Cities Coalitions	http://www.eere.energy.gov/cleancities
Maryland Energy Administration	http://energy.maryland.gov/transportation/idle/
Minnesota Pollution Control Agency	http://www.pca.state.mn.us/programs/sbomb_loan.html#evaluation
National Clean Diesel Campaign	http://www.epa.gov/cleandiesel
National Idling Reduction Network News	http://www.eere.energy.gov/vehiclesandfuels/resources/fcvt_national_idling.html

Selected links for further information

Information Source	URL
New York State Energy Research and Development Authority	http://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding_Opportunities/PON-2301-2011-Electric-Vehicle-Supply-Equipment-EVSE-Demonstration-and-Support-Program.aspx
North Central Texas Council of Governments	http://www.nctcog/org/trans/air/vehicles/investments/funding/index.asp
Ohio Environmental Protection Agency	http://www.epa.ohio.gov/oeef/schoolbus.aspx
Pennsylvania Small Business Advantage Program	http://www.portal.state.pa.us/portal/server.pt/community/financial_assistance/10495/advantage_grant/553249
Tennessee Department of Environment and Conservation	http://eerc.ra.utk.edu/etcfc/docs/2012/ctegp/CTEGP_Application-Manual.pdf
U.S. Government Accountability Office (Report GAO-12-261 lists 14 Federal programs that offer financial assistance to reduce diesel pollution)	http://gao.gov/assets/590/588274.pdf

Lastly, where can I find information in one place?

- Lists solicitations for funding and awards
- Alerts readers to changes in regulations and enforcement
- Provides links to idling cost calculators
- Describes new programs and recognitions of excellence
- Lists upcoming meetings

http://www.eere.energy.gov/vehiclesandfuels/resources/fcvt_national_idling.html

Let me know if you want to get it by email!